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Abstract

This paper addresses ego depletion as a mechanism influencing media-based stress recovery processes. Using structural equation modeling, relationships between ego depletion, procrastination, guilt, enjoyment, vitality, and recovery experience were tested using data from an online survey (N=471). Results suggest that ego depletion may increase the risk of negatively appraising the use of interactive (video games) and non-interactive (TV) entertaining media as a form of procrastination. The resulting guilt is negatively related to the recovery experience associated with using entertainment. Therefore, ego-depleted individuals may benefit less from the psychological recovery potential of entertainment media, despite their greater need for recovery. These findings are an important step in understanding the pivotal role of appraisal processes for media-induced recovery and the entertainment experience.

The Guilty Couch Potato: The Role of Ego Depletion in Reducing Recovery Through Media Use

Under what circumstances does entertaining media use allow people to flourish and increase psychological well-being? Alternatively, when do media users feel guilty, depressed or frustrated after exposure to entertaining media content? A growing number of studies suggest that the use of entertaining media may have a positive effect on psychological well-being by facilitating recovery from stress through the replenishing of depleted psychological resources (Reinecke, 2009a, 2009b; Reinecke, Klatt, & Krämer, 2011). However, a number of studies have also found a negative relationship between media use and well-being (Kubey & Csikszentmihalyi, 1990; Mathers et al., 2009; Robinson & Martin, 2008).

In the present paper, we propose that the way media users *appraise* their own use of entertaining media is key to our understanding of the effects of media exposure on psychological well-being. Ego depletion (Baumeister, Bratslavsky, Muraven, & Tice, 1998) may be an important predictor of such appraisal processes. Ego depletion describes temporarily reduced levels of self-control capacity (Baumeister et al., 1998) frequently experienced after effortful tasks demanding the exertion of "willpower". While exposure to entertaining media has the potential to offer a valuable source of recreation after stress and strain (Reinecke et al., 2011), we argue that ego-depleted individuals may be particularly prone to engage in *negative* appraisals of entertaining media use, perceiving it as an unjustified form of procrastination that, in turn, evokes guilt and diminishes recovery effects. Including this mechanism may help to better understand the mixed results regarding the use of entertaining media and well-being found in prior research.

In the following sections, we first explicate the theoretical concept of ego depletion and present research results supporting the strength model of self-control (Baumeister, Vohs, & Tice, 2007). We then propose a theoretical model linking ego depletion to negative appraisal of media use and to reduced media-induced recovery. This model is tested based on

data gathered in an online-survey among TV and video game users. Finally, the implications of the results will be discussed with regard to entertainment research in general and to research on media-induced recovery in specific.

Ego depletion and its Effects on the Appraisal of Media Use

Ego depletion has been defined as "a temporary reduction in the self's capacity or willingness to engage in volitional action caused by prior exercise of volition" (Baumeister et al., 1998, p. 1253). Ego depletion results from effortful and exhausting prior self-regulation, such as found in making decisions, adjusting to social norms, avoiding mistakes, and in many other tasks frequently encountered in daily life (Baumeister, 2002). According to the strength model of self-control (Baumeister et al., 2007), self-regulation is theorized to drain a limited psychological resource, akin to volitional energy or strength (Gailliot et al., 2007). Ego depletion refers to the state in which this resource of "willpower" is exhausted. In states of ego depletion, cognitive resources are impaired and perseverance in goal attainment is limited (Schmeichel, Vohs, & Baumeister, 2003). In a study by Baumeister et al. (1998), for example, ego-depleted individuals were less successful in complicated tasks, quit demanding tasks sooner, and were less persistent than less ego-depleted participants. Additionally, people in an ego-depleted state may feel tired and listless, long for "something nice" such as fatty foods or sweets, struggle to regulate themselves, act more on impulse (Vohs & Faber, 2007), and get more easily seduced by appealing stimuli (Bruyneel, Dewitte, Vohs, & Warlop, 2006). For example, Shiv and Fedorikhin (1999) found that ego-depleted people preferred tempting but unhealthy choices (chocolate cake) over less attractive but healthy choices (fruit salad).

The reviewed evidence suggests that ego-depleted individuals suffer from decreased volitional control and may be drawn to cognitively undemanding and hedonically rewarding activities. Exposure to entertaining media, i.e., media exposure that results in experiences that are "primarily pleasant and joyful" (Vorderer, 2001, p. 251), may represent such an appealing activity, thus it may be commonly sought by ego-depleted individuals (Hartmann, 2013). In

fact, recent time sampling research by Hofmann, Vohs, and Baumeister (2012), suggests a strong link between ego depletion and entertaining media use. In their study, the authors investigated the long term goals, immediate desires, and the self-control strategies used to regulate them in everyday life. The results demonstrate that the likelihood of giving in to fleeting desires increased with the number of acts of self-control previously employed that day. More importantly, however, the results also show that among all desires reported in the study, entertaining media use was the desire *least* successfully controlled in everyday life. That is, individuals, particularly those who were already fatigued, were more likely to give in to desires to use entertaining media than other temptations. Additional support for the notion of entertaining media use as a particularly challenging threat to self-control for ego-depleted individuals comes from a study by Wagner, Barnes, Lim, and Ferris (2012). The authors investigated the effects of reduced state self-control resulting from sleep deprivation on "cyberloafing", i.e., work hours that employees spend on personal media use such as visiting non work-related websites (Vitak, Crouse, & LaRose, 2011). The results presented by Wagner et al. (2012) showed that reduced self-control capacity is a strong predictor of personal media use during work hours. In sum, the presented research suggests ego-depleted individuals who suffer from reduced state self-control are less able to resist hedonic temptations. Media use is one of the desires most frequently experienced in everyday life. Due to their reduced self-control capacity, ego-depleted individuals show a strong tendency to give in to the desire of using media, even in situations where this desire interferes with other goals such as finishing work or completing other important tasks.

Consequently, ego-depleted individuals have a particularly high risk of experiencing a conflict between their use of entertaining media and other activities. Thus they may conceive of it primarily as a form of procrastination , i.e., "the act of needlessly delaying tasks to the point of experiencing subjective discomfort" (Solomon & Rothblum, 1984, p. 503), rather than a beneficial activity. Furthermore, for ego-depleted individuals, engaging in an

intrinsically rewarding, low effort-activity such as entertaining media use may increase the salience of their reduced self-control capacity. Seeking escape from their ego-depleted state through media exposure instead of engaging in other activities that demand higher volitional energy could be interpreted by media users as a sign of failed self-control (Panek, 2012). Thus, we propose a positive relationship between ego depletion and the appraisal of the use of entertaining media as an act of procrastination (H1).

Procrastination involves engaging in activities somebody finds pleasant, e.g., entertaining media use, while actively postponing the completion of other (more important or demanding) tasks (Lavoie & Pychyl, 2001). Despite this association with pleasant activities, procrastination is often associated with negative affect (van Eerde, 2003). More specifically, the impression of needlessly delaying tasks may trigger substantial feelings of guilt (Fee & Tangney, 2000). Accordingly, Lavoie and Pychyl (2001, p. 434) argue that "while those engaging in procrastination attempt to distract themselves with pleasurable activities, any enjoyment ultimately subsides and is replaced by regret, apprehension, and guilt". Guilt is a “dysphoric feeling associated with the recognition that one has violated a personally relevant moral or social standard” (Kugler & Jones, 1992, p. 218). The notion that procrastination through entertaining media use should be associated with feelings of guilt is further supported by results from Panek (2012). In a survey among college students, unscheduled media use was negatively related to trait self-control as well as the time spent on school work, and positively related to feelings of guilt. The fact that ego-depleted individuals have a particularly strong risk of experiencing a conflict between the use of entertaining media and other goals (Hofmann et al., 2012), and therefore may be more likely to see their media use as a form of procrastination, should make them particularly prone to feeling guilty about their media use. Based on previous research that has linked procrastination to feelings of guilt (Fee & Tangney, 2000; van Eerde, 2003), we thus predict a positive relationship between perceived procrastination and feelings of guilt (H2)

The Effects of Negative Appraisal on Media Enjoyment, Recovery, and Vitality

The first part of our proposed model addressed the potential association between ego depletion and negative appraisals of entertaining media use as a form of procrastination (H1) and resulting feelings of guilt (H2). The second part of our model addresses the effects of this negative appraisal of media use on media-induced recovery and enjoyment. Recovery from stress and strain is a crucial process of self-regulation that is closely tied to psychological well-being and physiological health (Sluiter, de Croon, Meijman, & Frings-Dresen, 2003; Sonnentag & Zijlstra, 2006). Recovery is defined as "the process of replenishing depleted resources or rebalancing suboptimal systems" (Sonnentag & Zijlstra, 2006, p. 331).

Successful recovery is closely connected to the leisure activities an individual engages in. Resource providing activities (e.g., social and physical activities) and low effort activities (e.g., relaxing on the couch) facilitate recovery, whereas resource-consuming activities (e.g., work-related or household activities) are negatively related to recovery experience (Ragsdale, Beehr, Grebner, & Han, 2011; Sonnentag & Zijlstra, 2006). Media use is a further factor that has a significant effect on recovery.

A series of current studies has demonstrated the recovery potential of entertaining media, and revealed a strong connection between media entertainment and recovery experience (Reinecke, 2009a, 2009b; Reinecke et al., 2011). Based on cross-sectional survey data, Reinecke (2009a, 2009b) demonstrated that recovery experience is highly salient during video game play, and that players frequently expose themselves to games after stress and strain. Reinecke, Klatt, and Krämer (2011) investigated the association between media-induced recovery experience and subsequent recovery outcomes. The results demonstrated a significant relationship between media-induced recovery experience and vitality (i.e., energetic arousal, see Thayer, 1989) as well as cognitive performance in a concentration test.

In sum, these results suggest that entertaining media are frequently used after stress and strain, elicit recovery experience, and are significantly associated with important recovery

outcomes such as vitality and task performance. In light of their strong recovery potential, entertaining media appear to be a promising resource for exhausted and ego-depleted individuals. In fact several studies show that positive emotions (e.g., from watching a comedy show) help to diminish ego depletion and to restore self-regulation (Muraven & Baumeister, 2000; Tice, Baumeister, Shmueli, & Muraven, 2007)[1]. We suggest however, that ego-depleted individuals may often feel bad about their use of entertaining media (see H1 and H2) and that this may greatly reduce the recovery potential of media enjoyment. This would present a paradoxical situation: Due to the negative appraisal of entertaining media use associated with high ego depletion, stressed and worn-out media users who desperately need to replenish their depleted resources (and who could benefit the most from the recovery potential of media enjoyment) may in fact obtain lower recovery effects than less ego-depleted individuals.

The notion of detrimental effects of negative appraisal on the outcomes of exposure to entertaining media is supported by prior research. In a time sampling study over the course of one year, Kubey and Csikszentmihalyi (1990) investigated the affective state of their participants during exposure to TV and a variety of other daily activities. The findings reveal that although television viewing is associated with a significant rise in relaxation and mood *during* TV exposure these positive effects quickly diminish *after* exposure. According to Kubey and Csikszentmihalyi (1990), the decreased positive affect after TV exposure may be indicative of a negative post-hoc appraisal: "In other words, viewers know that they could have done something more productive. It makes sense, then, that after viewing, people are less likely to feel as good about themselves as they do after sports or leisure" (p. 145).

Following a similar rationale, we propose that the higher tendency of ego-depleted individuals to engage in negative appraisal of their use of entertaining media will diminish the recovery effects of media exposure. As guilt is considered a dysphoric feeling (Kugler & Jones, 1992) and has been linked to aversive arousal states such as uncertainty, irritation, and anxiety (Baumeister, Reis, & Delespaul, 1995) it represents a stressor that draws on

psychological resources. The recovery experience usually associated with the use of entertaining media may be strongly delimited or even outweighed by the negative affect and arousal accompanying the experience of guilt. The guilt resulting from perceiving media use as a form of procrastination, then, could turn the use of entertaining media from a *resource-providing* into a *resource-consuming* activity negatively affecting recovery experience (Ragsdale et al., 2011). We thus expect to find a negative relationship between feelings of guilt associated with the use of entertaining media and media-induced recovery (H3).

Prior research has demonstrated that media-induced recovery is significantly related to indicators of psychological well-being, such as vitality (Reinecke et al., 2011). Vitality refers to the subjective feeling of aliveness and the level of energy subjectively available to the individual (Ryan, 1997) and thus represents a crucial recovery outcome. As the guilt experienced by ego-depleted individuals is likely to impair the recovery experience associated with media use (see H3), we further hypothesize that feelings of guilt will be associated with lower levels of vitality after media exposure (H4).

Finally, in addition to its negative effect on recovery experience and vitality, guilt is also likely to impair media enjoyment. Prior research suggests that feelings of guilt reduce media enjoyment (Hartmann & Vorderer, 2010; Lin, 2011). One explanation could be that individuals experiencing guilt engage in the denial of pleasure as a form of self-punishment in the absence of other opportunities to compensate for their own misbehavior (Nelissen & Zeelenberg, 2009). We thus predict a negative relationship between feelings of guilt regarding entertaining media use and media enjoyment (H5).

The proposed model was tested with regard to the use of both interactive (i.e., video games) and non-interactive (i.e., TV) media (see Figure 1). Video games provide a multitude of hedonic gratifications, such as challenge and competition (Sherry, Lucas, Greenberg, & Lachlan, 2006). Furthermore, prior research has demonstrated the potential of video games to facilitate recovery from stress and strain (Reinecke et al., 2011). The use of video games was

thus chosen as a context to test our hypothesized model as they 1) resemble a prototypical form of hedonic media use and 2) their recovery potential provides a sufficient context to test the potential implications of the negative appraisal of media use caused by ego depletion for the beneficial effects of media entertainment on psychological well-being.

We additionally tested our hypothesized model with regard to TV use to examine the proposed relationships in a different context of media use, thus strengthening the external validity of our results. This in an important extension of the scope of the present study as prior research has demonstrated significant differences in the recovery processes related to the use of interactive and non-interactive media. For example, Reinecke et al. (2011) experimentally compared the recovery effects of interactive (video game) and non-interactive (video clip) media stimuli. The use of a video game led to significantly higher levels of recovery experience than exposure to a video clip.

Consequently, ego depletion and the resulting negative appraisal of media use may affect the recovery effects of interactive and non-interactive media differently: As the overall recovery potential of non-interactive media appears to be lower as that of interactive media (Reinecke et al., 2011), ego depletion may have stronger detrimental effects on the recovery outcomes induced by non-interactive media. On the other hand, the negative appraisal of media use may be more relevant to recovery processes associated with non-interactive media such as television or movies that more closely resemble stereotypical "couch-potato behavior". It thus remains an open question, whether the pattern of statistical relationships predicted in H1 to H5 is invariant among media users exposed to interactive and non-interactive entertaining media (RQ1). In combination, the data obtained in the context of video game use and TV exposure in the present study provide the opportunity to explore this question.

Moreover, TV offers a much wider spectrum of programs and contents than video games. Indeed, not all entertainment shown on TV is hedonically pleasurable (e.g., drama;

war movies, etc.). Instead of joy and pleasure, the primary emotional result of these programs may be feelings of sadness and contemplation (Oliver & Bartsch, 2010; Oliver & Raney, 2011). In addition, TV not only provides entertainment fare, but also more "serious" and cognitively challenging content like news programs or documentaries. Consequently, TV exposure cannot be considered a form of entertaining media use per se. The distinction between pleasurable vs. and non-hedonic forms of TV content is crucial in the context of the present study as ego-depleted individuals are drawn to hedonically pleasant and non-challenging activities (Shiv & Fedorikhin, 1999). With regard to TV exposure this may imply a preference of ego-depleted individuals for light and enjoyable TV content. To address this question and to explore whether ego depletion affects the choice patterns of TV users (RQ2), the preference for challenging vs. entertaining content was thus assessed as an additional variable in the TV context. This extends the scope of the present study by providing preliminary insights into the effects of ego depletion on selective exposure.

Method

Sample and Procedure

A total of 635 respondents participated in an online survey that assessed ego depletion and a variety of variables related to media use on the preceding day. Participants were recruited on a popular German gaming website (www.4players.de, n = 293) as well as in psychology and communication classes at two universities in Germany (n = 279) and Switzerland (n = 63). Only the responses of participants who had 1) engaged in work (either at their job or at the university/school) and 2) had played video games or watched TV on the preceding day were included in the data analyses. The cases of 164 participants who did not meet these criteria were excluded and the model was tested using the data of the remaining 471 participants (61.8 percent males, M_{age} = 25.1 years, SD = 6.12 years). On average, participants reported having worked M = 6.50 hours on the preceding day (ranging from 0.5

hours to 16 hours, *SD* = 2.47 hours). The sample thus includes participants with considerable variations in workload experienced on the preceding day. To restrict the length of the online survey, all participants responded to a version of the questionnaire that either addressed exposure to television or the use of games on the preceding day, exclusively. Participants who reported having used both types of media on the preceding day were automatically assigned to one of the two questionnaires: participants recruited on the gaming website who had both watched TV and played games on the preceding day were assigned to the games-related version of the questionnaire, whereas participants in the student sample who had used both media types were assigned to the TV version of the survey. In sum, 262 participants responded to the games-related items and 209 participants to the TV-related version of the survey. Participants in the games survey reported an average of *M* = 2.60 hours of video game use on the preceding day (*SD* = 1.73 hours) whereas participants responding to the TV survey reported having watched TV for *M* = 1.99 hours on the preceding day (*SD* = 1.09 hours).

Measures

Ego depletion. The level of ego depletion on the preceding day was assessed with 16 items from the State Self-Control Capacity Scale (Ciarocco, Twenge, Muraven, & Tice, 2007). Participants responded to the items (e.g., "Yesterday after work/school, I felt like my willpower was gone" and "Yesterday after work/school, I felt drained") on a scale from 1 "does not apply at all" to 7 "fully applies". The scale showed a high internal consistency (Cronbach's $\alpha = .924$).

Perceived Procrastination. Feelings of procrastination associated with media use on the preceding day were assessed with five items of the Procrastination Scale by Tuckman (1991). The wording of the items was adapted to fit the respective media use condition (e.g., "Yesterday, I [watched TV/played video games] after work/school to find an excuse for not doing something else"), and the items were rated on a scale from 1 "does not apply at all" to 5 "fully applies". The scale showed and internal consistency of Cronbach's $\alpha = .910$.

Guilt. Feelings of guilt associated with media use on the preceding day were measured with 5 items of the State Shame and Guilt Scale (Marschall, Saftner, & Tangney, 1994). Participants responded to the items (e.g., "When I [watched TV/played video games] yesterday after work/school, I felt remorse" and "When I [watched TV/played video games] yesterday after work/school, I felt bad about it") on a scale from 1 "does not apply at all" to 5 "fully applies". The internal consistency of the scale was satisfactory (Cronbach's $\alpha = .927$).

Recovery Experience. The 16 items of the Recovery Experience Questionnaire (Sonnentag & Fritz, 2007) were used to assess media induced recovery experience on the preceding day. Items (e.g., "When I [watched TV/played video games] yesterday after work/school, I relaxed") were rated on a scale from 1 "strongly disagree" to 5 "strongly agree". The scale showed a satisfactory internal consistency (Cronbach's $\alpha = .818$).

Vitality. The 10 items of the energy and tiredness subscales of the Activation Deactivation Adjective Checklist (ADACL, Thayer, 1989) were used to assess vitality after media use on the preceding day. Both subscales consist of five adjectives each (e.g., "energetic", "sleepy"). Participants rated the extent to which each of these adjectives described how they felt after watching TV or playing video games, respectively, on the preceding day on a scale from 1 "does not apply at all" to 5 "fully applies". Items of the tiredness subscale were negatively coded and both subscales were combined to form an indicator of vitality after gameplay. The reliability of this scale was Cronbach's $\alpha = .912$.

Enjoyment. Three items rated on a scale from 1 "does not apply at all" to 5 "fully applies" were used to assess the enjoyment of watching TV or playing video games, respectively, on the preceding day. The items were: "I enjoyed [watching TV/playing games] yesterday after work/school", "I liked [watching TV/playing games] yesterday after work/school", "[Watching TV/Playing games] yesterday after work/school was enjoyable". The scale had a satisfactory internal consistency (Cronbach's $\alpha = .893$).

Preference for Challenging vs. Easy TV Content. Nine items were adapted from Oliver and Raney (2011) to measure selective exposure to cognitively challenging (e.g., "Yesterday after work/school, I preferred TV programs that challenge my way of seeing the world," or "Yesterday after work/school, I preferred TV programs that make me think") versus light and entertaining forms of TV content (e.g., "Yesterday after work/school, I preferred TV programs that are simple but fun," or "Yesterday after work/school, I preferred TV programs that are happy and positive"). Participants rated all items on a scale from 1 "does not apply at all" to 5 "fully applies". Items measuring the preference for easy and entertaining content were reverse coded so that higher mean scores represent a stronger preference for challenging content. The scale showed a satisfactory internal consistency (Cronbach's $\alpha = .797$).

Results

Zero-order correlations of all variables included in the model are presented in Table 1. The hypothesized model was tested on the basis of a structural equation model computed with the AMOS 21.0 statistical package using the maximum likelihood method. To test all hypotheses with regard to the use of video games and exposure to TV separately, a two-group model representing the two groups of participants who responded to the TV vs. games-related items was computed. Consistency between data and the proposed model was evaluated based on two criteria. First, path coefficients needed to be in the predicted direction and magnitude. Second, model fit was assessed with established fit indices. Model fit was tested based on the χ^2 and the CMIN/*df* statistics and a combination of three additional fit indices recommended by Hu and Bentler (1999, p. 5): the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean square of residuals (SRMR).

The directions of all observed path coefficients are consistent with the predicted model (see Figure 1). Furthermore, the fit indices indicated an acceptable overall fit, $\chi^2(1104) = 1987.58$, $p < .001$, CMIN/*df* = 1.80, CFI = .910, RMSEA = .041, 90% CI [.038, .044], and

SRMR = .09. We thus concluded that the predicted model is consistent with the data. Assessment of normality demonstrated that the data significantly deviated from multivariate normality (Mardia's normalized estimate of multivariate kurtosis = 177.14). As recommended for the analysis of non-normal data (Byrne, 2010), all hypotheses were thus additionally tested using bootstrapping. Ninety-five-percent bias-corrected confidence intervals were computed for all parameters reported in Figure 1 based on 5000 bootstrap samples with replacement. All significant statistical relationships reported below were confirmed with the bootstrap method.

The first part of our model deals with the relationship between ego depletion, procrastination, and guilt. Confirming H1, a positive relationship was found between ego depletion and the appraisal of both playing video games ($\beta = .18$, $p < .01$) as well as watching TV ($\beta = .20$, $p < .001$) as an act of procrastination. H2 predicted a positive relationship between procrastination associated with media use and feelings of guilt, and was also confirmed both for the use of video games ($\beta = .61$, $p < .001$) as well as for watching TV ($\beta = .57$, $p < .001$).

The second part of our model addresses the effects of the negative appraisal of media use on media-induced recovery, vitality, and enjoyment. H3 predicted a negative relationship between feelings of guilt regarding media use and media-induced recovery experience and was supported by the data both with regard to the use of games ($\beta = -.25$, $p < .01$) as well as exposure to TV ($\beta = -.26$, $p < .01$). We further predicted a negative relationship between guilt and vitality in H4, which was confirmed both with regard to playing games ($\beta = -.25$, $p < .01$) and watching TV ($\beta = -.23$, $p < .001$). Finally, H5 predicted a negative relationship between feelings of guilt and media enjoyment and was supported by the data with regard to the use of video games ($\beta = -.26$, $p < .001$) as well as watching TV ($\beta = -.20$, $p < .01$). [2]

To further explore RQ1, the invariance of the path structure of the two models (use of video games vs. exposure to TV) was tested by comparing the initial unconstrained two-group model presented in Figure 1 to five additional models, each constraining one of the five paths

predicted in H1 to H5. A significant decrease in model fit (i.e., a significant increase in χ^2) from the unconstrained to one of the constrained models indicates a significant difference in the strength of the respective paths between participants in the video games vs. the TV group (Byrne, 2010). However, the results of the model comparisons indicated no significant decrease in model fit between the unconstrained and any of the five constrained models (all $\Delta\chi^2(1) \leq 1.77$, all $ps \geq .18$). Thus, the statistical relationships predicted in H1 to H5 did not vary significantly between the video games and the TV group. Accordingly, our results suggest that ego depletion is associated with similar patterns of negative appraisal and reduced positive outcomes in terms of well-being and enjoyment both in the context of interactive as well as non-interactive media use. [3]

To address RQ2, the relationship between ego depletion and the preference for challenging versus easy TV content was explored with regression analysis. Ego depletion was negatively related to exposure to challenging TV content ($\beta = -.19$, $p < .01$), providing preliminary support for a significant relationship between ego depletion and selective exposure to hedonically pleasant and unchallenging TV programs.

Discussion

The aim of the present study was to extend previous research on entertaining media use and psychological well-being by investigating 1) the association of ego depletion with the negative appraisal of entertaining media use and 2) the potential implications of this negative appraisal on positive outcomes of entertaining media use such as recovery, vitality, and enjoyment. The results of the present study were generally consistent with our hypothesized model. The first part of our model addressed the mechanism linking ego depletion to the negative appraisal of entertaining media use. Consistent with our expectations (H1), ego-depleted participants showed a higher tendency to perceive entertaining media use as a form of procrastination. This finding is consistent with previous research that has linked ego

depletion to decreased levels of self-control and demonstrated that ego-depleted individuals are at a higher risk of giving in to temptations such as entertaining media use than non-ego-depleted individuals (Hofmann et al., 2012). Furthermore, as predicted in H2, perceived procrastination was strongly associated with feelings of guilt with regard to entertaining media use (similar to recent findings reported by Panek, 2012).

The potential implications of this negative appraisal of entertaining media use on recovery and enjoyment were addressed in the second part of our model. As predicted, the guilt experienced in regard to the use of entertaining media was negatively related to media-induced recovery experience (H3) and vitality (H4) in interactive as well as non-interactive media. The results thus demonstrate that the negative appraisal of the use of entertaining media associated with ego depletion reduced the positive effects of media exposure on psychological well-being. Lastly, as predicted in H5, feelings of guilt were also negatively related to the enjoyment of both video games and TV. Addressing our research question regarding possible differences between different types of media use, the pattern of results did not show any significant variations among the data of participants using video games vs. TV.

The results of the present study have three main implications for communication and entertainment research in general, and research on media-induced recovery and well-being in particular. First, the present study extends communication research by providing a new perspective on appraisal processes related to entertaining media use. Prior research has frequently addressed appraisal processes with regard to media *content*, and the fit between a mediated message and the goals and needs of recipients, that may ultimately lead to entertainment (Reinecke et al., 2012; Tamborini et al., 2011; Vorderer & Hartmann, 2009). The present study extends this line of research by demonstrating the pivotal role of the appraisal of the *activity* of media use for enjoyment and well-being. The present study extends prior research by introducing ego depletion as an underlying psychological mechanism for negative appraisals and guilt related to media entertainment. The results from H1 and H2

suggest that the *conflict* that ego-depleted individuals experience as a consequence of choosing to use entertaining media at the expense of other, more demanding (but potentially more rewarding or "reasonable") tasks, is a key mechanism linking ego depletion to the negative appraisal of entertaining media use. Rather than a guilty conscience regarding entertaining media use or the duration of media use, the act of *giving in* to the urge for media seems to fuel the tendency of ego-depleted individuals to feel guilty about their media use. [4]

Second, the findings from the current study extend prior research on entertaining media use and well-being by demonstrating that the negative appraisal of entertaining media use accompanying states of ego depletion was negatively related to the recovery effects of both interactive and non-interactive entertaining media. These findings suggest that the tendency of ego-depleted media users to perceive a conflict between entertaining media use and other tasks may restrict the ability of media users to profit from increased well-being after media use. We do not believe, however, that the findings of the present study put the general potential of entertaining media to increase well-being into question. Rather, we suggest that the presented results may help to resolve the disparity between findings that illustrate the ability of entertaining media to facilitate well-being (e.g., Reinecke et al., 2011; Reinecke et al., 2012; Tamborini et al., 2011), and other studies that demonstrate a negative relationship between entertaining media use and well-being (Kubey & Csikszentmihalyi, 1990; Mathers et al., 2009; Robinson & Martin, 2008), by identifying the negative appraisal of entertaining media use associated with ego depletion as a potential explanation of these ambivalent results. Rather than diminishing the beneficial potential of entertaining media, we believe that the results of the present study may ultimately help to optimize the well-being outcomes of entertaining media use by extending our knowledge of the mechanisms furthering and hindering media induced recovery and general well-being.

Third, the present study provides preliminary evidence of selective-exposure processes related to ego depletion. With regard to RQ2, our results revealed that ego-depleted

individuals show a preference for easy and entertaining, rather than challenging, TV content. The results extend the scope of the present study by suggesting that the media *content* consumed by an individual may be an important predictor of feelings of guilt. Intellectually and emotionally challenging media content has been shown to satisfy eudaimonic needs by depicting moral virtue or addressing issues related to purpose in life (Oliver & Bartsch, 2010). It thus may be appreciated as a *meaningful* and therefore valuable form of entertainment that serves long-term goals (Oliver & Bartsch, 2010; Oliver & Raney, 2011). On the other hand, "lowbrow" forms of media entertainment addressing affective or hedonic needs appear more likely to lead to the feelings of guilt (Panek, 2012). As demonstrated by our results, ego-depleted individuals, due to their strong susceptibility for cognitively undemanding and hedonically rewarding activities (Shiv & Fedorikhin, 1999), are particularly prone to choosing such lowbrow media content over cognitively or emotionally challenging content, which should further increase their risk of feeling guilty about their media use. Furthermore, the results extend research on the use of non-hedonic and eudaimonic forms of entertaining media (Oliver & Bartsch, 2010; Oliver & Raney, 2011; Tamborini et al., 2011) by introducing ego depletion as a situational factor influencing exposure to such media content.

Despite the strong support for our model and the relevance of the findings for entertainment research, several limitations to the current study must be noted. The first potential limitation refers to the strategy of data collection applied in the present study. In an online survey, participants were instructed to think about the preceding day and answer questions with regard to their volitional energy and their use of entertaining media in retrospect. Prior research has provided strong evidence of the ability of survey participants to accurately reconstruct activities and subjective experiences of the preceding day (Kahneman, Krueger, Schkade, Schwartz, & Stone, 2004). Nevertheless, the retrospective self-reports assessed in the present study may have been distorted by the attempt of some participants to justify or rationalize entertaining media use by inferring high levels of ego depletion.

Participants may have reported higher levels of ego depletion to excuse their own procrastination. Such limitations of retrospective self-report data can only be resolved by future research applying diary or time sampling measures, such as those utilized by Hofmann et al. (2012), to allow for data collection over the course of several consecutive days, thus providing a more complete and detailed picture of the causal interplay of ego depletion, appraisal processes, and the outcomes of entertaining media use.

The second limitation concerns the cross-sectional nature of the data gathered in the present study. The effects found in cross-sectional data may be subject to confounded variables and do not provide proof of causality. It could thus be argued that our statistical model represents an arbitrary selection of directed effects and that the directed paths should be replaced by non-directed associations. We believe, however, that the implicit time structure inherent in the measures applied in present study suggests specific directions of effects. As reported in the method section, the items of our ego depletion measure assessed the level of ego depletion after returning from work or school. Thus, this measure implicitly refers to the respondents' situational self-control capacity *after* work and *prior* to media exposure. The remaining items were worded in a way that referred to the respondents experience *during* (appraisal of entertaining media use as a form of procrastination, guilt, media-induced recovery experience, enjoyment) or after (vitality) the use of video games and TV. This implicit time order is represented by the directed effects within our model. Although the data fully support our hypotheses and the results are consistent with all our theoretical considerations, some of the relationships hypothesized in our model may also be plausibly interpreted in a different direction. For example, instead of assuming a direct relationship between perceived procrastination and guilt (H2) resulting in reduced enjoyment (H5), enjoyment could alternatively be seen as a moderator of the relationship between procrastination and guilt. That is, media users might only feel guilty about their media use if they do not enjoy it and thus consider it a waste of time. In a similar vein, instead of

proposing a direct negative relationship between guilt and recovery experience (H3), it would also be plausible to assume that recovery experience moderates feelings of guilt, implying that media use might only lead to the perception of wasting ones time and feelings of guilt if it does not result in positive recovery outcomes.[5] Consequently, the effects found in the present study, and the direction of influences observed in our statistical model need to be validated by future experimental research.

A final limitation concerns the fact that, to restrict the length of the survey, participants responded to a version of the questionnaire that either addressed the use of TV or video games. Participants in the student subsample were asked only about their TV use in case they reported that they used both TV and video games the day before. Conversely, if participants recruited from the video game site said they used both media the day before, we asked only about their video game use. However, based on this approach, not all participants in the sample may have been asked about their primary media activity (i.e., the one they spent most time with), nor may all participants have been asked about the medium that they used first after they returned from school or work. Furthermore, the way the questionnaire (games vs. TV) was distributed within the two subsamples (students vs. participants recruited via the gaming website) may have introduced confounds in our tested model. As a consequence of our sampling strategy, the data used to test our model with regard to the use of video games predominantly stem from the website sample, whereas the data used to test the model with regard to TV exposure predominately stem from the students sample. It could be argued that the sample structure may limit the representativeness of the findings for a broader population. However, we do not expect the basic processes under investigation in this study that link ego depletion to negative appraisals of entertaining media use to differ systematically between frequent video game players, students, and the general population. Thus, we do not expect these differences to affect the appraisal processes under investigation in the present study.

While the present study provides new insights into the processes addressed in our model, a number of questions remain open for future research. It could be argued, for example, that the effects found in the present study are not media-specific, but should extend to any recreational activities. While we agree that the increased risk of ego-depleted individuals to negatively appraise their behavior may also apply to other hedonic activities, we believe that the results found in the present study are of particular relevance in the context of entertaining media use. First, the *accessibility* of entertaining media use underlines its pivotal importance as a hedonic activity sought after by ego-depleted individuals. The rich media landscape we live in offers a plethora of opportunities to use media. The availability of media-related cues (e.g., the presence of a TV set or the smart-phone on one's desk) that may trigger the desire to turn to media content at the cost of other activities seems to be a particular challenge for ego-depleted individuals as they are especially prone to impulsive choices (Baumeister, 2002). At the same time, mobile devices or IT-infrastructure make entertaining media use accessible in situations (e.g., at the workplace) that are characterized both by high levels of need for recovery and the presence of competing tasks, resulting in a particularly high risk for ego-depleted individuals to experience conflict between their recreational media use and other goals. Furthermore, entertaining media use has lower *transaction costs* than other forms of recreation. In contrast to other hedonic activities, such as social interaction (e.g., meeting friends at a bar) or cultural activities (e.g., going to a concert or the museum), media use is increasingly available without the need to change location or coordinate activities with other parties. Thus the overall energy expenditure necessary to engage in media use is comparably low, which should make it more attractive for depleted individuals. Finally, the *normative value* of entertaining media use distinguishes it from other forms of recreation. Compared to other leisure time activities, entertaining media use seems to be perceived as less productive and culturally valuable (e.g., see Williams, 2003, for an analysis of the public image of the use of video games). Individuals engaging in entertaining

media use rather than other, more socially valued leisure activities such as sports, personal improvement activities like meditation or art, or social activities, might thus be especially prone to feel guilty when indulging in media instead. Consequently, although the model tested in the present study may not apply to entertaining media use exclusively, the aforementioned characteristics of media use demonstrate the specific value of our model to further our understanding of the appraisal of media use: While other leisure time activities, such as meditation, yoga, etc., are frequently appraised as valuable and restorative, the popular conceptualization of entertainment media characterizes them as undesirable activities with no restorative value (e.g., television as the "boob-tube", "idiot box", "squawk box", etc.). Despite this negative public image of entertaining media use, we nevertheless engage in this activity for almost three hours a day (Bureau of Labor Statistics, 2011). This is a contradiction that our study helps to start to untangle, however future research should encompass cultural conceptions of entertaining media use as well as compare media use with other recreational activities to determine if these effects are truly media-specific.

Additional questions remain regarding further mechanisms linking ego depletion to the negative appraisal of media use. While the present study identifies the perceived conflict between entertaining media use and other goals of the individual as *one* important factor, many other variables are likely to provide additional insights into this relationship. Individual differences, for example, might be significant moderators of the association between ego depletion and the negative appraisal of media use. The conflict between entertaining media use and other goals might be particularly salient for individuals with high trait achievement orientation (Nicholls, 1984), as they should perceive procrastination as a stronger violation of their standards than less achievement oriented persons. Correspondingly, the relationship between ego depletion and negative appraisal might also be influence by cultural differences in achievement orientation (Salili, 1994), with ego-depleted individuals from less achievement oriented societies having a higher chance of benefiting from the restorative

effects of entertaining media use. Furthermore, research suggests that the effects of ego depletion on self-regulation may be a developmentally-linked effect that decreases with age (Dahm et al., 2011). There are no such findings examining entertaining media use and well-being by age in a similar fashion, however adults do appear to use entertainment less for negative motives (to pass time, to forget) and more for positive motives (to learn, to share, to connect with others) as they age (Ostman & Jeffers, 1983). It may well be that recovery processes for older adults are thus less affected by the negative appraisal processes resulting from ego depletion due to a) fewer problems with self-regulation due to ego depletion and b) more positive motives overall for media use.

Finally, the present study does not provide an answer to the question under what circumstance ego-depleted individuals do *not* feel guilty about media use. In combination with previous work on media-induced recovery (Reinecke 2009a, 2009b), the present study suggests that entertaining media use after phases of exertion may result in two different appraisal processes: Individuals may either perceive entertaining media use as a legitimate activity, a deserved reward after a hard working day resulting in recovery, or as a failure of self-control and a lack of resistance towards their desire for media use resulting in feelings of guilt. The processes that guide media users onto those two routes of appraisal, however, remain unknown. In sum, these open questions demonstrate that the search for further variables that explain *when* and *why* (ego-depleted) media users feel guilty about their media use is an important task for future research.

Overall, the present study on "the guilty couch potato" furthers our understanding of the complexity of the interplay of appraisal processes, entertaining media use, and well-being. It reveals preconditions and mechanisms central to the positive psychological potential of media entertainment. Further explicating these mechanisms and addressing the open questions outlined above appears to be a promising endeavor for future research.

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Footnotes

[1] It could be argued that the fact that ego-depleted participants in the study by Tice et al. (2007) experienced positive affect while watching a comedy contradicts our notion that ego depletion is associated with a negative appraisal of media use (see H1 and H2). However, we do not see a conflict between the findings from Tice et al. (2007) and our hypotheses. In the present study, we propose that the reduced self-regulatory resources of ego-depleted individuals put them at a particularly high risk of giving in to the desire of using media even when media exposure is in conflict with other goals, resulting in negative appraisal of media use. In other words, *choosing* media use instead of engaging in other important but effortful activities should result in perceived procrastination and feelings of guilt. As the participants in the study by Tice et al. (2007) were *assigned* to the media use condition by the experimenter, they had no reason to experience goal conflicts and feelings of guilt.

[2] To account for the significant zero-order correlations between recovery experience, vitality, and enjoyment (see Table 1), the residuals of these variables were allowed to covary in our statistical model.

[3] It has to be noted that the sub-samples that were used to compute the two-group model comparing the use of interactive vs. non-interactive media use contained participants that used *both* video games and TV on the preceding day. A total of 136 participants (51.9 %) in the video game subsample reported that they had also watched TV on the preceding day, and 20 participants (9.6 %) in the TV subsample had also played video games. While the small share of video game players in the TV subsample appears negligible, the substantial overlap in the video game sample represents a potential confound. To address this problem, a two group SEM testing the paths predicted in H1-H5 was computed based on 1) the whole video game sample (n = 262) and 2) participants who had exclusively played games on the preceding day (n = 126). Both models were tested for invariance by comparing the initial unconstrained two-

group model to five additional models, each constraining one of the five paths predicted in H1 to H5. The results of the model comparisons indicated no significant decrease in model fit between the unconstrained and any of the five constrained models (all $\Delta\chi^2(1) \leq 1.8$, all ps $\geq$ .18). Thus, the statistical relationships observed regarding H1 to H5 in the video game subsample (see Figure 1) did not vary significantly between participants who had exclusively used video games on the preceding day and those who had played games *and* watched TV.

[4] Our data provide additional evidence for the pivotal role of the experience of conflict rather than the duration of media use per se as a key mechanism linking ego depletion to the negative appraisal of media use. Ego depletion was not significantly related to the duration of media use, neither with regard to watching TV (β = .13, p = .064), nor with regard to using games (β = -.06, p = .301). This suggest that rather than being related to an increase in media use per se, ego depletion is positively associated with the subjective experience that media exposure impedes the attainment of other, more important goals (i.e., perceived procrastination, see H1). Furthermore, the duration of media use did not significantly predict feelings of guilt, neither in the TV (β = .09, p = .205) nor in the games condition (β = .04, p = .565). Finally, duration did not moderate the effects of perceived procrastination on guilt, neither in the TV (β = -.05, p = .457), nor in the games subsample (β = .01, p = .900). Finally, it could be argued that the duration of media use and guilt may follow a quadratic relationship: Media user might feel especially guilty if they engage in media use very shortly (i.e., too short to profit from recovery effects) or very long (i.e., long enough to feel substantial conflict between media use and other goals). To address this possibility, the quadratic function between the duration of media use and guilt was tested using non-linear regression. However, the quadratic term did not reach significance either in the games (b_1 = .011, b_2 = .000, p = .941) or in the TV subsample (b_1 = .266, b_2 = -.030, p = .121). In combination, these results further strengthen our argumentation that it is conflict with other

activities rather than the mere duration of media use that makes ego-depleted individuals particularly prone to experiencing guilt regarding their media use.

[5] We would like to thank an anonymous reviewer for bringing these potential directions of effects to our attention. In fact, upon further inspection, both enjoyment (β = -.09, p < .05) as well as recovery experience (β = -.12, p < .01) significantly moderated the relationship between procrastination and guilt. Procrastination was more strongly related to feelings of guilt for media users who experienced lower levels of enjoyment and recovery experience.

Table 1

Means, standard deviations, and zero-order correlations.

	M	*SD*	1.	2.	3.	4.	5.
1. Ego depletion	3.71	1.16	-				
2. Procrastination	1.99	1.08	.22**	-			
3. Guilt	1.51	.82	.25**	.57**	-		
4. Recovery	3.51	.58	-.15**	-.16**	-.24**	-	
5. Vitality	2.94	.85	-.39**	-.23**	-.29**	.35**	-
6. Enjoyment	4.03	.90	-.10*	-.08	-.25**	.43**	.38**

Note: * = $p < .05$; ** = $p < .01$

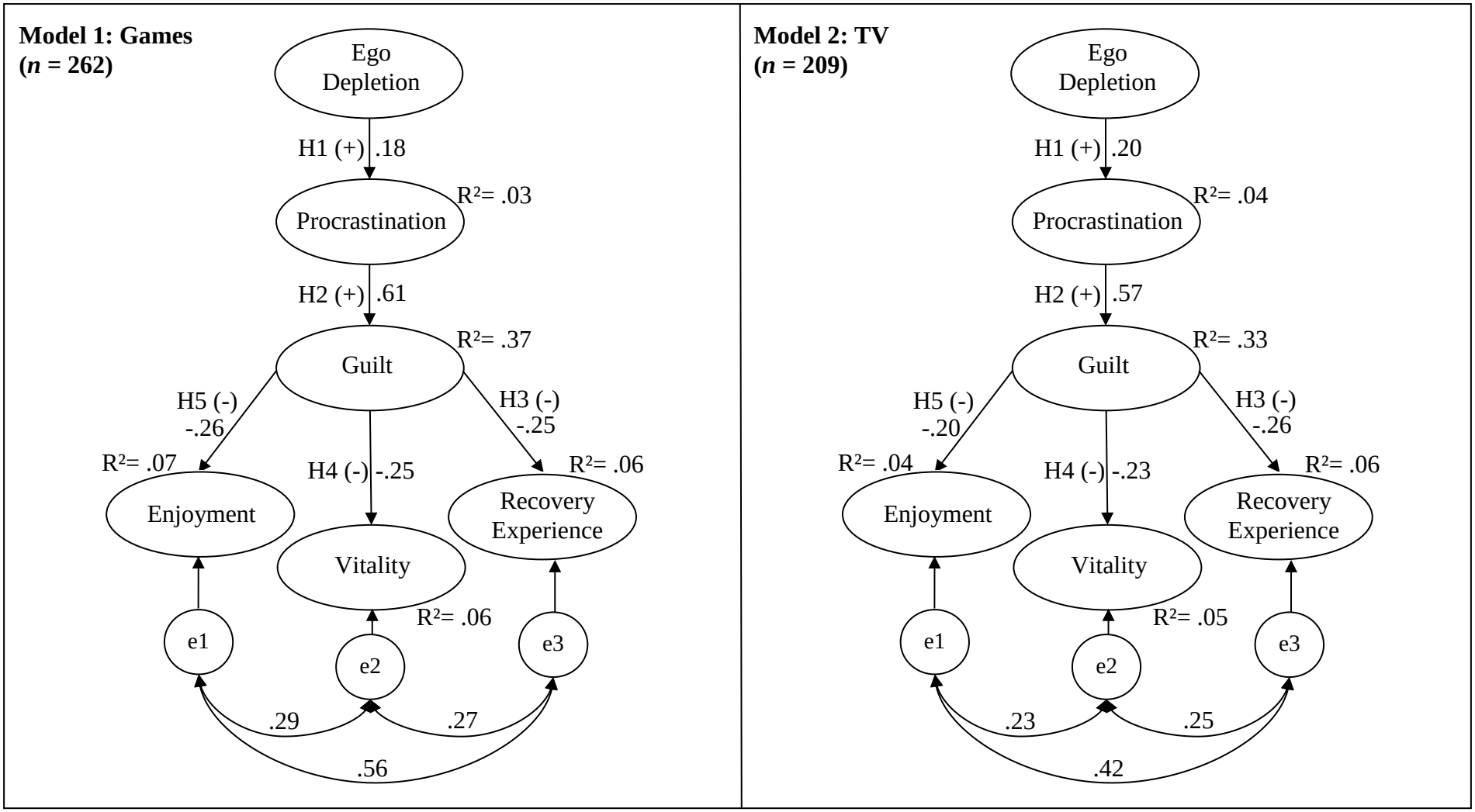

Figure 1. Observed two-group structural equation model with hypotheses labeled, $\chi^2(1104) = 1987.58$, $p < .001$, CMIN/*df* = 1.80, CFI = .910, RMSEA = .041, SRMR = .09. Scores in the figure represent standardized path coefficient significant at $p < .01$.